International Journal of Social Science Research and Review

http://ijssrr.com
editor@ijssrr.com
Volume 6, Issue 4
April, 2023
Pages: 638-642

Change of Agrochemical Status of Salinated Soils When Cooperative Cultivation of Sunflower, Salmon and Soy Crops

Sherali Nurmatovich Nurmatov[1]; Jamaliddin Kazakjanovich Shadmanov[2]; Khumoyiddin Tojievich Bekmurodov[3]

[1]Doctor of Agricultural Sciences, Professor, Scientific Research Institute of Selection, Seed Production and Agrotechnology of Growing Cotton, Uzbekistan

[2] Candidate of Agricultural Sciences, Senior Research Fellow, Scientific Research Institute of Selection, Seed Production and Agrotechnology of Growing Cotton, Uzbekistan

[3] Doctor of Philosophy in Agricultural Sciences, Scientific Research Institute of Fine Fiber Cotton, Uzbekistan

E-mail: xumoyiddin.bekmurodov@mail.ru

http://dx.doi.org/10.47814/ijssrr.v6i4.1229

Abstract

It has been determined that the yield of agricultural crops will increase by 8 to 10 quintals per hectare in exchange for safeguarding the soil from salinization and preserving the soil's fertile layer. In this article, lucerne is planted at a rate of 22–24 and 16–18 kg per hectare on desert sandy soils prone to wind erosion, mineral fertilisers are applied at a rate of N 100, P 150, and K 100 kg per hectare, and when sunflower is grown in cooperation with legumes and soybeans, i.e. Information on the results obtained when 42,0 to 56,0 thousand sunflower seedlings and 150,0 to 250,00 thousand seedlings of companion crops were left and N 120, P 80, K 60 kg and N 180, P 120, K 90 kg were applied per hectare.

Keywords: *Lucerne Compatible Crops in Saline Soils Sunflower; Mung Bean; Soybean Seedling Thickness; Mineral Fertilizer Standards; Humus Nutrients*

Introduction

In the Republic of Uzbekistan's agricultural development strategy for 2020–2030, one of the key objectives is "... improving the amelioration of irrigated lands, rational and economical use of water resources, and, on this basis, achieving the stability of agricultural product manufacturing".

In this regard, maintaining and increasing soil fertility by planting a variety of crops in our republic, supplying the populace with ecologically clean food products, bolstering the feed base for

livestock, and conducting scientific research on obtaining high–quality crops from agricultural crops are essential responsibilities.

Article 72 of the concept of effective use of land and water resources in agriculture, approved by the Decree of the President of the Republic of Uzbekistan No. PD–5742 of June 17, 2019 "On measures for the effective use of land and water resources in agriculture", states that "increasing soil productivity, reducing soil erosion and degradation". The fact that tasks have been assigned for "acceleration of scientific research aimed at prevention" necessitates large–scale scientific research.

In exchange for preventing soil salinization and sustaining the fertile layer of soil, it has been determined that the yield of agricultural crops will increase by 8 to 10 centners per hectare in global agriculture. In this regard, research on the development and improvement of modern agrotechnologies for the effective use of the existing land area through the application of intensive methods to agricultural production, the conditions in which land reclamation is deteriorating as a result of salinization processes, and the cooperative planting of a variety of agricultural crops are deemed urgent.

Methodology

In saline soil–filled lysimeters at the institute, researchers conduct experiments, observations, and analyses. On the basis of manuals, "Methodology of irrigation experiments with cotton" (1981), "Methodology of agrochemical research" (1977), and "Methods of conducting field experiments" (Tashkent, Uzbek Scientific Research Institute of Cotton Breeding, 2007) were conducted.

Results and Discussion

The amount of humus in the soil layer (0–30 cm) at the beginning of the operation period in studies conducted to determine the effect of sunflower, mung bean, and soybean crops grown in the experimental system on the general forms of humus, nitrogen, and phosphorus in saline soils was 0.553%, the amount of nitrogen in the soil layer (0–30 cm) was 0.553%, and the amount of phosphorus in the soil layer (0–30 cm) was 0.553%. Phosphorus was 0.056%, humus was 0.467%, nitrogen was 0.048%, and phosphorus was 0.040% in the soil's sub–layer (30–50 cm). The nitrogen concentration per kilogramme is 10.1 mg/kg, the phosphorus content per kilogramme is 18.2 mg/kg, and the potassium value per kilogramme is 60 mg/kg. The nitrogen concentration per kilogramme is 7.6 mg/kg, the phosphorus content per kilogramme is 12.5 mg/kg, and the potassium content per kilogramme is 50 mg/kg (Table 3.1.1.1).

In the experiment, lucerne was planted at a rate of 22–24 kg per hectare at the end of the effective period of cultivated crops. In the cultivated variant 1 (control), the amount of humus in the soil layer (0–30 cm) was 0.556%, nitrogen was 0.063%, and phosphorus was 0.048%; in the soil sub–layer (30–50 cm), humus was 0.468%, nitrogen 0.050%, and phosphorus 0.041%, and when studying the mobile forms of nitrogen, phosphorus and potassium, the amount of nitrogen in the soil layer (0–30 cm) was 10, 5 mg/kg, phosphorus 18.4 mg/kg, potassium 60 mg/kg, and the amount of nitrogen 7.8 mg/kg, phosphorus 12.6 mg/kg was found to be 50 mg/kg of potassium.

In the second option (control), the soil layer (0–30 cm) contained 0.558% humus, 0.065% nitrogen, and 0.049% phosphorus, while the soil beneath the soil layer (30–50 cm) contained 0.469% humus, 0.052% nitrogen, and 0.043% phosphorus. Lucerne was planted at a seedling density of 16–18 kg per hectare. When the mobile forms of nitrogen, phosphorus, and potassium were analysed, it was determined that the soil stratum (0–30 cm) contained 10.7 mg/kg of nitrogen, 18.6 mg/kg of phosphorus, and 60 mg/kg of potassium.

When 42,000 sunflower bushes per hectare and 150,000 sorghum bushes are planted together, there is 0.553% humus and 0.063% nitrogen in the top 30 centimetres of soil. Humus was 0.468%, nitrogen was 0.050%, and phosphorus was 0.042% in the stratum of soil below the soil (30–50 cm), while nitrogen and phosphorus were 0.050% and 0.042%, respectively. Nitrogen content is 10.2 mg/kg, phosphorus content is 18.2 mg/kg, and potassium content is 60 mg/kg, and nitrogen content is 7.6 mg/kg kg, phosphorus content is 12.6 mg/kg, potassium content is 50 mg/kg.

The planting density of sunflower is 56,000 bushes per hectare, and 250,000 bushes of mung bean are left and cultivated together. Mineral fertilisers are applied at the rates of N 180, P 120, and K 90 kg per hectare. Phosphorus is 0.061%, and in the sub–surface soil layer (30–50 cm), humus is 0.470%, nitrogen is 0.055%, and phosphorus is 0.045%. Layer contains nitrogen 10.6 mg/kg, phosphorus 18.4 mg/kg, potassium 65 mg/kg, and nitrogen content 8.0 mg/kg in the sub–surface layer (30–50 cm), it was observed that phosphorus was 12.7 mg/kg, and potassium was 53 mg/kg.

When the planting density of sunflower is 42,000 bushes per hectare and 150,000 bushes of soybean are kept together, the amount of humus in the furrow (0–30 cm) stratum of the soil at the conclusion of the operation period is 0.554%, nitrogen is 0.059%, and phosphate is 0.054%. In the 30–50 cm stratum, humus was 0.468%, nitrogen was 0.048%, and phosphorus was 0.043%. The driven (0–30 cm) soil layer contained 10.3 mg/kg of nitrogen, 18.3 mg/kg of phosphorus, and 60 mg/kg of potassium. The soil layer (30-50 cm) contained 7.6 mg/kg of nitrogen, 12.5 mg/kg of phosphorus, and 12.5 mg/kg of potassium. The value was determined to be 50 mg/kg.

At the end of the operation period, the amount of humus in the soil layer (0–30 cm) was 0.563% when the sunflower planting density was 56,000 bushes per hectare and 250,000 bushes of soybean were left. In the sub–layer (30–50 cm), nitrogen is 0.069%, phosphorus is 0.063%, and humus is 0.471%. (0–30 cm). The nitrogen content is 10.8 mg/kg, the phosphorus content is 18.6 mg/kg, and the potassium content is 65 mg/kg. In comparison, the nitrogen content is 8.1 mg/kg, the phosphorus content is 12.8 mg/kg, and the potassium content is 53 mg/kg.

Table 1
Changes in the total and mobile forms of humus, total nitrogen, and phosphorus in saline soils when sunflower, mung bean, and soybean are planted together

In saline soils										
Variant	Soil layers, cm	Seedling thickness, thousand bush/ha	Seed consumption kg/ha	Rate of mineral fertilizers, kg/ha	Common forms, %			Active forms, mg/kg		
					Hummus	N	P	$N–NO_3$	P_2O_5	K_2O
At the beginning of the validity period 9.04.2022										
In the general background	0–30	–		–	0.553	0.056	0.046	10.1	18.2	60
	30–50	–		–	0.467	0.048	0.040	7.6	12.5	50
At the end of the validity period 5.10.2022										
1 (control) lucerne	0–30		22–24	N–100, P–150, K–100	0.556	0.063	0.048	10.5	18.4	60
	30–50				0.468	0.050	0.041	7.8	12.6	50
2 (control) lucerne	0–30		16–18	N–100, P–150, K–100	0.558	0.065	0.049	10.7	18.6	60
	30–50				0.469	0.052	0.043	7.9	12.7	50
Sunflower + mung bean	0–30	42,000 sunflower bushes, 150,000 mung bean bushes		N–120, P–80, K–60	0.553	0.060	0.050	10.2	18.2	60
	30–50				0.468	0.050	0.042	7.6	12.6	50
Sunflower + mung bean	0–30	56,000 sunflower bushes, 250,000 mung bean bushes		N–180, P–120, K–90	0.561	0.067	0.061	10.6	18.4	65
	30–50				0.470	0.055	0.45	8.0	12.7	53
Sunflower + soybean	0–30	42,000 sunflower bushes, 150,000 soybean bushes		N–120, P–80, K–60	0.554	0.059	0.052	10.3	18.3	60
	30–50				0.468	0.048	0.043	7.6	12.5	50
Sunflower + soybean	0–30	56,000 sunflower bushes, 250,000 soybean bushes		N–180, P–120, K–90	0.563	0.069	0.063	10.8	18.6	65
	30–50				0.471	0.056	0.46	8.1	12.8	53

Conclusion

In saline soils, lucerne, partner crops sunflower + mung bean and sunflower + soybean plants, at a seedling thickness of 56 and 250,000 bushes/ha, as well as mineral fertilisers at different rates, the amount of humus and nutrients in the soil was humus, nitrogen, and phosphorus compared to the beginning of the operation period. Compared to the beginning of the season, the total amount of phosphorus, N–N03, and exchangeable P2O5 increased marginally in the tillage (0–30 cm) layer of the soil, while the amount of humus and nutrients remained unchanged in the other options.

References

Нурматов Н.Н., Гуломжонов А.Г. Новая технология полива на склонах // Хлопководство. – Тошкент, 1979. №5. стр. 32–34.

Нурматов Н.Н., Гуломжонов А.Г. Орудие для нарезки борозд // Хлопководство. – Тошкент, 1982. №5. стр. 29–30.

Нурматов Ш.Н., Мирзажанов Қ,М., Нурматова М. Нишаб ерларда ғўзани суғориш технологияси // Ғўза етиштиришни ҳозирги замон технологияси. Илмий амалиу конференция тўплами. – Тошкент, 1993. – б. 102–105.

Поляков Ю.П. Ирригационная эрозия почвы и меры борьбы с ней на Северном Кавказе // Труды ВНИИГ. – Москва, Минвопхоза СССР, 1974. вып 3. стр. 120–126.

Саттаров Ж.С. Ўзбекистон суғориладиган тупроқлари унумдорлиги ўзгариши, уни ошириш ва муҳофаза қилиш концепцияси // Атроф муҳитни ўзгариши шароитида ер ресурсларини муҳофаза қилиш ва улардан оқилона фойдаланиш масалалари Республика илмий-амалий семенар маърузалар тўплами. – Тошкент, 2016. – б. 70–71.

Сафаров С.Р. Влияние элементов рельефа на развитие эрозияонных процессов в средней и нижней части бассейна р. Акора. // Труды АзНИХИ. – Баку, 1975. стр. 34–38.

Соипов Б., Исмаилов И. Ирригационная эрозия и меры ее предотвращения. // Хлопководство. – Тошкент, 1983. №6. стр. 22–23.

Хакимбердиев О.Э., Содиқова Г.С. Ўзбекистоннинг ер–сув ресурслари: муаммова ечимлар. // “Ўзбекистон тупроқларининг унумдорлик ҳолати, муҳофазаси ва улардан самарали фойдаланиш масалалари”. Республика илмий-амалий конференцияси. Илмий мақолалар тўплами. Тошкент. 2017. – б. 14–26.

Хамдамов М.Х., Назаралиев Д.В., Исаев С.Х., Хошимов И.Н. Ирригаця эрозиясига мойил ерлардаги қишлоқ хўжалик экинлари табиатни мухофаза қилиш ва сувни тежаш техналогияларини ишлаб чиқиш // Ўзбекистон Республикаси қишлоқ ва сув хўжалигида сув ва ресурс тежовчи агротехналагиялар: Халқаро илм. амал.конф мақоллар тўплами. – Тошкент, 2008. – б. 128–132.

Хошимов И.Н. Исаев С.Х., Назаралиев Д. Ирригация эрозиясига учраган ерларни суғориш // Тупроқ унумдорлигини оширишнинг илмий ва амалий асослари: Халқаро илм. амал.конф. мақол.тўп. – Тошкент, 2007. – б. 50–52.